

**REMARKS**

This paper is response to an Office Action mailed on March 23, 2005. Prior to this response, claims 22-40 were pending. After amending claims 23-28, 35, and 37-38, claims 22-40 remain pending.

Section 6 of the Office Action objects to the drawings, as not showing the limitations recited in claim 37. In response, claim 37 has been amended to recite that the adhesive thickness is greater than the wire grid height.

Section 7 of the Office Action objects to the specification, under 37 CFR 1.75(d)(1) and MPEP608.01(o), as failing to provide proper antecedent basis for the limitation recited in claim 25. The Office Action states that the product of the adhesive thickness and air gap cavity area do not necessarily yield the air gap cavity volume, as the thickness of the air gap varies due to the height of the wire grid elements encroaching into the air gap cavity.

In response the Applicant submits that claim 25 does not, and is not intended to recite "the volume of air in the air gap cavity". The Applicant agrees that if this recitation was used, then the volume would be affected by the height of the wire grid elements. The claim specifically defines the air gap cavity volume to be the product of the maximum (after amendment) adhesive thickness and the air gap cavity area. It is not relevant to the definition that this volume can be filled. Further, the Applicant's use of the term "volume" is entirely conventional. For example, a bottle having a 1 gallon volume is considered a 1-gallon bottle, regardless of whether it is filled with a liquid, or empty. More particularly, the air gap cavity volume does not change, regardless of whether wire grid elements encroach into the space.

Section 8 of the Office Action objects to informalities in claims 28 and 38. Specifically, the Office Action states that the adhesive thickness can be zero if one references the contact point between the spaces in the adhesive and the opposing prism faces. In response, the claims have been amended to recite --an adhesive maximum thickness--, as opposed to "an adhesive thickness".

Section 10 of the Office Action rejects claim 37 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. In response, claim 37 has been amended to recite that the adhesive thickness is greater than the wire grid thickness.

In Section 12 of the Office Action claims 22, 30-34, and 39-40 have been rejected as unpatentable with respect to Ito et al. ("Ito"; US Pub. 2003/0179345) in view of Matsuda (US 5,703,861). The Office Action states that Ito describes several elements of the claimed invention, but acknowledges that Ito fails to describe an adhesive between the polarizer and the prism, or a cavity formed by an adhesive. The Office Action also states that Matsuda describes a grid polarizer secured to a substrate via a spacer or raised projection of solder adhesive, and that it would have been obvious for one of ordinary skill to use an adhesive between a polarizer and prism such that an air gap cavity is formed by the surrounding adhesive. This rejection is traversed as follows.

An invention is unpatentable if the differences between it and the prior art would have been obvious at the time of the invention. As stated in MPEP § 2143, there are three requirements to establish a *prima facie* case of obviousness.

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaack* 947 F.2d 488, 20 USPQ2d, 1438 (Fed. Cir. 1991).

In Fig. 16 Ito describes a reflective polarizer 4 that uses a structural birefringent polarizing plate 21, which is described in the explanation of Figs. 2A and 2B [0178]. Polarizing plate 21 has a light transmissive substrate 210 in close contact with the surface of second prism 40, and a fine thin metal film structure 211 that faces first prism 10 across a small space [0179].

In Fig. 8 Matsuda describes a transparent heat sink 32 mounted to an optical coupling device 31. The heat sink surface (32a) between the heat sink and coupling device supports polarizers 34A and 34B, which include a wire grid (col. 5, ln. 35-50). Matsuda states that heat sink 32 is joined to the coupling device 31 by solder layers 47A and 47B in an outer peripheral sealing region (col. 6, ln. 1-8). Matsuda does not state that the solders layers 47A and 47B form a sealed air cavity around polarizers 34A and 34B. Since the solders layers are shown and labeled as independent elements, the solder layers are not joined (are not a continuous layer around the perimeter). This assumption is bolstered by Matsuda's statement, "(a)s shown in Fig. 9C, the optical coupling device 31 which has been fabricated as described above, is joined to the wiring patterns 43 on the transparent substrate 32A by solder layers 47A, 47B with junction down. If necessary, the optical coupling device is *encased in a molded body of resin for protection*

*from the ambient atmosphere* (emphasis added, see col. 7, ln. 14-21).

Although Matsuda may use solder to join substrate layers, the solder does not form a sealed cavity.

The Office Action states that it would have been obvious at the time of the invention form an air gap cavity around the interface of polarizer and prism surfaces using an adhesive, as taught by Matsuda, in the assembly of Ito, for the purpose of providing a fixed and rigid alignment of prism blocks and wire grid polarizer, thus reducing alignment and light scattering losses in the polarized light beam splitter assembly. With respect to the first *prima facie* requirement to support a case for obviousness, the Applicant respectfully submits that there is no evidence to support a motivation to combine Matsuda's device with Ito's.

The issue of motivation does not concern itself with whether there is some element of commonality (i.e., a polarizer) between references. If it did, then any two references could be combined merely as the result of a common keyword. Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion of motivation in the references to do so." *In re Mills*, 916 F.2d 680, 682, 16 USPQ2d 1430, 1432 (Fed. Cir. 1990). Here, the analysis must determine if there is any motivation to modify Ito's assembly in such a manner as to teach the claimed invention. Matsuda may possibly provide a motivation to use solder layers between substrates. However, the claimed invention is not simply the use of an adhesive. The Applicant respectfully submits that Matsuda does not suggest that Ito be modified to use solder (or any adhesive) to form a sealed cavity. Alternately stated, even if there is a motivation to combine the Matsuda and Ito references, the invention suggested is not the claimed invention.

Considered from the perspective of the second *prima facie* requirement, even if an expert were given the Matsuda and Ito inventions as a foundation, there is no reasonable expectation that this expert could derive the claimed invention, since the claimed invention describes a functionality (a cavity formed by a surrounding adhesive) that is not present in either of the references.

With respect to the third *prima facie* requirement, there is at least one clear distinction between the claimed invention and the cited prior art references. Although Matsuda does describe to use of a solder layer to join substrates, he does not show the formation of a cavity using a surrounding adhesive. Matsuda's cross-sectional views describe separate solder layers 47A and 47B that are not joined. Matsuda includes several plan view views of his assembly. However, none of these plan views show a cavity formed by solder layers. Further, as noted above, Matsuda uses a resin encasement as protection from the ambient atmosphere. Matsuda neither shows nor explicitly describes the formation of a cavity surrounded and/or formed using solder layers. Since Matsuda does not describe an air gap cavity surrounded by an adhesive, and Ito does not even describe an adhesive, the combination of references does not describe the sealed cavity limitations of the claims 22 and 34. Neither does the prior art suggest any modifications that make these limitations obvious. Claims 30-33, dependent from claim 22, and claims 39-40, dependent from claim 34, enjoy the same distinctions from the cited prior art and the Applicant respectfully requests that the rejection be removed.

In Section 13 of the Office Action claim 23 has been rejected as unpatentable under 35 U.S.C. 103(a) with respect to Ito in view of Matsuda.

The Office Action states that Matsuda describes a wire grid height that is less than the adhesive thickness. This rejection is traversed as follows.

Regardless of the wire grid height and adhesive thickness, the combination of the Matsuda and Ito references still fails to explicitly describe or suggest an air gap cavity surrounded by an adhesive, as recited in claim 22. Claim 23, dependent from claim 22, enjoys all the distinctions from the prior art detailed above in the response to Section 12 of the Office Action.

In Section 14 of the Office Action claims 24, 35, and 37 have been rejected as unpatentable under 35 U.S.C. 103(a) with respect to Ito in view of Matsuda. The Office Action states that although Matsuda does not describe a uniform adhesive thickness, this feature would have been obvious to one of skill in the art. This rejection is traversed as follows.

Regardless of the uniformity of the adhesive thickness, the combination of the Matsuda and Ito references still fails to explicitly describe or suggest an air gap cavity surrounded by an adhesive, as recited in claims 22 and 34. Claim 24, dependent from claim 22, and claims 35 and 37, dependent from claim 34, enjoy all the distinctions from the prior art detailed above in the response to Section 12 of the Office Action.

In Section 15 of the Office Action claim 25 has been rejected as unpatentable under 35 U.S.C. 103(a) with respect to Ito in view of Matsuda. The Office Action states that one of ordinary skill in the art would have known how to determine the volume of the cavity. This rejection is traversed as follows.

Regardless of how the cavity volume is determined, the combination of the Matsuda and Ito references still fails to explicitly describe or suggest an air gap cavity surrounded by an adhesive, as recited in claim

22. Claim 25, dependent from claim 22, enjoys all the distinctions from the prior art detailed above in the response to Section 12 of the Office Action.

In Section 16 of the Office Action, claims 26, 27, 29, and 36 have been rejected as unpatentable under 35 U.S.C. 103(a) with respect to Ito and Matsuda, and further in view of Yamada et al. ("Yamada"; US 6,013,339) and Ishiwatari (JP 11007027). The Office Action states that Ishiwatari and Yamada teach the use of spherical spaces to define an adhesive thickness, and that it would have been obvious to use the spacers in the beam splitter assembly of Ito, in view of Matsuda. This rejection is traversed as follows.

Even if Ishiwatari and Yamada use spherical spacers in an adhesive, the combination of the four references still fails to explicitly describe or suggest an air gap cavity surrounded by an adhesive, as recited in claims 22 and 34. Claims 26, 27, and 29, dependent from claim 22, and claim 36, dependent from claim 34, enjoy all the distinctions from the prior art detailed above in the response to Section 12 of the Office Action.

In Section 17 of the Office Action, claims 28 and 38 have been rejected as unpatentable under 35 U.S.C. 103(a) with respect to Ito and Matsuda, and further in view of Yamada and Ishiwatari. The Office Action states that Ishiwatari and Yamada fail to specifically disclose a 30 micron adhesive thickness, but that such a thickness would have been obvious to obtain. This rejection is traversed as follows.

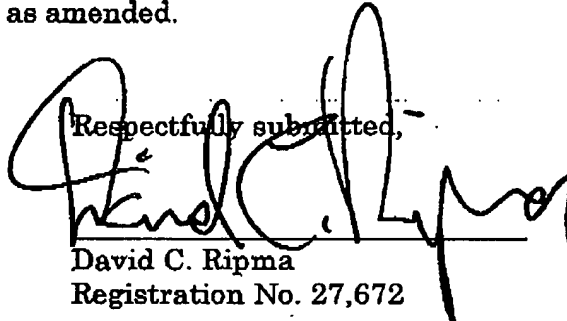
Even if Ishiwatari and Yamada did disclose an adhesive thickness of 30 microns, the combination of the four references still fails to explicitly describe or suggest an air gap cavity surrounded by an adhesive, as recited in claims 22 and 34. Claim 28, dependent from claim 22, and claim 38, dependent from claim 34, enjoy all the distinctions from the prior art detailed above in the response to Section 12 of the Office Action.

Applicant respectfully requests entry of this Amendment and  
reconsideration of the application as amended.

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Respectfully submitted,



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